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Redman Coxe, M.D., formerly Professor of Materia Medica in the University of Pennsylvania. Communicated by the Secretary.

Dr. Coxe having gathered a Fungus and placed it on a sheet of white paper, leaving it until the next day, found several drops of an inky fluid, slowly trickling from the inner surface, which had assumed a black appearance; by placing the Fungus in a glass, the whole except the outer skin liquefied. The colour of the fluid was rather a deep bistre than black, and being left in the glass, in a few hours it separated into a solid sediment, with a lighter coloured fluid swimming above. Having afterwards collected a considerable quantity of fluid from the same species, he obtained by drying an extract of a pretty deep black colour of both parts conjoined, which would otherwise have separated. This on trial formed an admirable bistre-like water-colour, well adapted for drawing when mixed with a little gum.

Dr. Coxe used the "fresh inky fluid as ink, and from such fresh fluid the accompanying drawings were made;" but it was soon found that its change was too rapid to think of depending on it for such a purpose, he therefore was led to dry it as quickly as possible by spontaneous evaporation, and then to use it diluted with water. Having exposed various portions of writing thus made to the direct rays of the sun for several months with little change, he tried the effects of chlorine and euchlorine gas, muriatic acid, and ammoniacal gases: from these but a trifling change ensued, except from the muriatic acid gas, which destroyed very considerably the dark tint of the writings. He also placed some small and recent specimens of the Fungus in a solution of corrosive sublimate, which preserved them and prevented any deliquescence: the same effect was produced by alcohol.

The ink is fully formed and escapes in about three or four days. When received into a phial, in a short time the heavier and blacker matter was found to settle as a sediment; the lighter brownish amber-coloured fluid surmounts it, and may be poured off from it to dry them separately. From a good-sized specimen nearly half an ounce of fluid has been obtained.

The following chemical experiments among others were made:—

1. Two drachms of the fluid added to  $\zeta$  1 of hydrate gave a clear brown transparent solution, to which in separate glasses was added
2. *Nitrate of Silver*: no effect at first, but in a few minutes dark brown flocculi subsided, leaving a transparent fluid above.
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8. *Dilute Muriatic Acid*. The same, but much smaller in amount.

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Read, "A Notice of the Birds of Iceland, accompanied by specimens." By George Townshend Fox, Esq., F.L.S.

It is perhaps not generally known that the Durham University has established a Museum as one of the necessary appendages of an academical institution; the subcurator of which, Mr. Wm. Proctor, requested and obtained permission to go out to Iceland in the summer of 1837 to procure a collection of the birds of that island. Three months were passed on the most northern part of Iceland, this locality being chosen by Mr. Proctor as one least visited by naturalists,

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and therefore the most likely to repay his labours by the number or rarity of the specimens to be obtained. Skins of fifty-two species of birds were brought home, besides skins of six Rein Deer, three species of Seals, two large Fishes (*Anarrhicas*), and a Porpoise.

Frederick Faber in his Ornithology of Iceland, published at Copenhagen in 1822, enumerates eighty-four species of birds; of which about twenty are land birds, and sixty water birds. Faber adopted the nomenclature of Linnæus, but an examination of the skins brought home by Mr. Proctor has led to the belief that several of Faber's birds are not identical with the Linnean species. The Iceland Falcon is considered by Mr. Hancock\* as distinct from the whiter falcon of Greenland. The Iceland Grouse is correctly considered by Faber as peculiar to that island. The Bridled Guillemot, *Uria lacrymans*, Laphyl., is for various reasons believed to be a species distinct from the Common Guillemot, *Uria Troile*, Lath. *Clangula Barrovi* was found breeding on the ground in a nest formed of its own down, and placed among aquatic plants a little above high-water mark. Some rare eggs were also obtained, namely, those of the Iceland Falcon, Little Auk, Bridled Guillemot, and Slavonian Grebe.

Read also a paper, "On the Structure and Development of the Reproductive organs of *Pilularia globulifera*." In a letter to R. H. Solly, Esq., F.R.S. and L.S. By William Valentine, Esq., F.L.S.

The author observes, that the involucre of *Pilularia globulifera* contains two kinds of bodies, which, however, occupy distinct sacs; one kind are round, very numerous, and minute, not larger than the 460th part of an inch; they are found principally in the upper part of the involucre, and are about forty in each sac. The other kind are of an oblong pyriform shape, a little constricted near the middle, with a conical projection at one extremity, and are much less numerous, about sixty, and occur singly in each sac; they are about the 80th part of an inch broad, and have the power of germination, which the former kind do not appear to possess. Both kinds are loose in their sacs, and have an opaque, pure white, minutely granular, testaceous covering, and are imbedded in a kind of gelatin, which softens and expands by the action of water, but is not completely dissolved. The larger bodies, the undoubted sporules, after a very slight maceration in water, (less than a minute is sufficient,) are en-

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The sporule consists of three coats, the outer of which is white, opaque, somewhat brittle, more or less incomplete at the conical extremity, but much thickened about the upper third of the sporule, where it exhibits traces of cellularity. The middle coat is membranous, elastic, of a light yellowish brown colour, and perforated at the apex of the conical projection which is essentially formed by this coat, the outer coat being gradually lost upon its surface, or in some instances being scarcely continued on to it, in which case the sporule appears truncated, the middle membrane not having sufficient firmness of itself to support the conical form. This conical projection is more or less plicated, and in those instances in which the outer coat is very deficient the middle membrane exhibits lines radiating from the aperture. The third coat, or internal membrane, is similar in colour to the middle, differing from it however in being inelastic, and not being continued into the cone, but forming a short cavity, by passing directly across the base of the cone, at which point it is not in contact with either of the other membranes, and is marked by three lines, which radiate from the centre of the unsupported portion, and indicate a valvular structure to allow of the protrusion of the growing matter in germination. The cavity of the sporule is occupied by a quantity of grumous fluid and particles, which are of various sizes, the larger ones being mostly of an ovoid shape, but altering by pressure.

I found many of these sporules in a germinating state, the majority having escaped from the involucre, but in several instances I found them considerably advanced in germination before the rupture of the involucre and whilst they were yet inclosed in their sacs. The first external sign of germination is either the appearance of four cells projecting through the apex of the conical projection or a general swelling of that part. By dissection, however, we can observe this process at an earlier period, and I find upon removing the conical projection that the first evidence of germination having commenced is an appearance of cellularity within the unsupported or valved portion of the internal membrane, which is transparent; and I now find for the first time a very delicate pellucid membrane lining the whole cavity of the sporule, and having the cells

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which give the appearance just mentioned either lying on its external surface or forming that portion of it which lies beneath the valves. From the appearances and impossibility of separating the cells from the membrane I am inclined to believe that the cavity formed by this membrane is completed by the cells, or, in other words, that the sac is partly membranous and partly cellular. It is possible that this last described membrane may exist before germination begins, notwithstanding the numerous unsuccessful dissections which I have made to discover it, the failure being owing to its extreme delicacy; but I am pretty well satisfied that it is a product of germination, because I have not the slightest difficulty in demonstrating it after that has commenced, nor is there the slightest trace of it in any stage of the development of the sporule. However this may be, it is quite certain that fresh cells are gradually formed on the external surface of the cellular part of the sac, and that the valves of the third membrane are very soon ruptured and gradually turned back by the growth and protrusion of this button-like cellular germ. The enlarging cellular mass then distends the conical projection, unfolding the plicæ of that body, and at length appears externally, with four of its cells projecting beyond the general mass and compressed into a quadrangular form, I fancy by the pressure of the apex of the cone, the aperture in which is quadrangular. These projecting cells soon harden and acquire a reddish brown hue, and in the advanced stage of germination appear like a brown quadrangular space, which I should have little hesitation in referring to the above cause did I not find several similar spaces on the germinating sporules of *Isoetes lacustris*, which I could not refer to such an origin: it must be observed however that I have not seen the earlier stages of germination in *Isoetes*. Soon after the exposure of the entire germ, which is effected by the reflexion of the valves and conical membrane over the side of the sporule, where they lie quite concealed by the germ, little fibrillæ or rootlets begin to shoot from one side. They are simply articulated tubes or elongated cells applied end to end with frequently a bulbous extremity, and each is produced from one of the cells of the germ. They differ much in length in different sporules; in some they are not longer than the sporule, whilst in others they are three or four times that length, and, in common with the cells of the germ, contain granules which in these are colourless but in the germ green. The cluster-like appearance of the cells which form the germ, soon after the appearance of these fibrillæ begin to change, the cells becoming flatter and more intimately connected with each other. At the same time an internal change is taking

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place, for by a gradual arching or receding upwards of that part of the germ which closes the cavity of the sporule the germ becomes hollow, the hollow communicating with the cavity of the sporule, which is of course proportionably enlarged. The germ now gradually points in two places, which are by no means fixed, but occur in various situations according to the position of the sporule in relation to the light. The direction of the first leaf is generally in the direction of the axis of the sporule, or rather a little inclined, and that of the first root at right angles or lateral, but very soon changing to an opposite direction to that of the leaf. This would be the constant direction if the sporules were always left to themselves free from entanglements, on account of the peculiar structure of their outer coats; the spongy fibro-cellular texture of the superior third of which, causing that end to be the most buoyant in the water, exposes the superior surface of the germ to the direct action of the light; but as it cannot always happen that the sporules should be free, the direction of the leaf and root is sometimes quite the reverse, and at others both leaf and root are lateral, but proceeding from opposite sides of the germ. These two points gradually lengthen, and if dissected each will be found to consist of a closed sheath, containing in one instance the leaf, in the other the root in the form of a conical process like a finger in a glove. The young leaf, which is taper and its cells crowded with green granules, being in advance of the root, which is obtuse and destitute of green granules, bursts through the summit of its sheath when it has become rather longer than the sporule, whilst the root, although more backward in its development, pierces its sheath before it is as long as the sporule. The sheaths are not distinct, but communicate with each other; and the only point of connexion between the sheath (there being in fact but one) and the germ is around its base close to the sporule, so that nearly the whole of the germ is inclosed in this sheath. Besides this sheath which embraces the upper part of the root, there is an exceedingly delicate expansion, which so closely embraces the extremity of the root like a cap, that it is only by a careful examination that it can be discovered. I am not aware that this has ever had any connexion with the sheath through which the root bursts, but, on the contrary, I believe it to be a distinct formation. After the leaf has grown many times the length of the sporule, or about 2 lines long, another leaf grows from the germ close to the first, to which it is in all respects similar, and then a bud begins to be developed from some indefinite part of the germ, but like the leaves and root from within the sheath, which is now frequently much lace-

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rated. This bud is covered by a peculiar kind of jointed hairs, whose attachments are lateral, at a short distance from their bases, and they contain a few colourless granules. This bud sometimes appears after the first leaf, in which case there is no second primordial leaf formed, and is the rudimentary stem, the first growth from it being a leaf which exhibits, although in a small degree, the first evidence of gyration, and shortly after a root which is furnished with its own sheath. As I have not seen more advanced specimens, I am unable to describe the succeeding steps; but as, up to this point, my observations were made upon several hundred examples, I may safely affirm that the instances were sufficiently numerous for my purpose.

All the leaves after the primordial ones, or those which grow direct from the germ, are developed in a similar manner to ferns, and even the running stem partakes in a slight degree of the same gyrate evolution. The roots are all formed in sheaths, through the apices of which they ultimately burst; the sheath continuing to embrace the base of the root, whilst a distinct and far more delicate sheath closely embraces its point. Transverse sections of the stem, root, and leaves show them all to be hollow with the cavity divided longitudinally into separate channels. In the stem these longitudinal partitions are about fifteen or sixteen in number, and in the leaf and root they are about ten or twelve, which in the latter are arranged in pairs. These partitions radiate from a central column of enlarged cells which surround a bundle of minutely dotted ducts that may be unrolled spirally, and the channels between these partitions are frequently divided by transverse partitions or diaphragms. The cells which form these partitions are curiously arranged—they are flattened on two opposite sides, and connected with each other by their narrow sides and extremities, but only at intervals, so that there are numerous holes formed which afford a free communication between all the channels. In the partitions of the root the intervening holes are so large in proportion to the breadth of the cells that these have the appearance of a string of beads. Another peculiarity of the root is, that, in addition to the diaphragms formed of this tissue, which are also found in the stem and leaf, a peculiar body is frequently met with occupying a similar position to the diaphragms. These bodies (for they are sometimes numerous) are each formed of one or more cylindrical cells coiled up in a gyrate manner. They grow from the angle formed by the partition and the cuticle, and are developed subsequent to the other tissue, for they may be found in various stages of advancement in the same root. Their nature I have not been able to ascertain.

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The author then proceeds to describe the development of the spores. A transverse section of the involucre when about the size of a small pin's head shows it to consist of four integuments, containing a mass of very delicate spongy compressible cellular tissue, subdivided into four equal triangular portions by four lines radiating from the centre. In the centre of each of these portions is a cavity, and projecting into each of these cavities are a number of nipple-like processes which are attached in each cavity to a common receptacle, whilst this again is connected with an open rigid cellular tissue that lies between the spongy tissue before described and the involucre, and serves as a connexion between the two. As the involucre advances, the spongy tissue recedes all round the four cavities, which consequently become larger and afford more space for the growth of the nipple-like processes. This recession of the spongy tissue is not caused by the pressure of the growing processes, for it is frequently in advance of them; but it is produced by a gradual condensation inherent to the tissue around the cavities and along the radiating dividing lines, which, in fact, are nothing more than this condensation, which at maturity is so complete that the whole of the spongy tissue is condensed into four dissepiments, dividing the cavity of the involucre into four equal loculi. The nipple-like processes are found upon a careful examination to be hollow sacs with obscurely cellular walls—those which occupy the lowest part of the involucre being considerably in advance of the upper ones. These sacs contain a quantity of grumous matter, and a number, perhaps about ten, of soft rather opaque pulpy bodies, which are evidently compounded of four closely connected parts so placed on each other as to form a cone with a triangular base.

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Mr. Owen read a Paper on a New Species of the genus *Lepidosiren* of Fitzinger and Natterer. The author commenced by advertizing to the first announcement of that anomalous animal, the *Lepidosiren paradoxa*, as the type of a new genus of Perennibranchiate Reptiles by Fitzinger at the meeting of the German naturalists at Prague in 1837, and to its subsequent description by its discoverer Dr. Natterer, the well-known South American traveller.

With the generic characters assigned by these able German naturalists to their *Lepidosiren*, the species described by Mr. Owen fully and closely agreed; but it differed specifically in the greater relative length of the head and rudimental extremities, and its much smaller size.

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Mr. Owen observed, that since the time of the discovery of the *Ornithorhynchus* there had not been submitted to naturalists a species which proved more strongly the necessity of a knowledge of its whole organization, both external and internal, in order to arrive at a correct view of its real nature and affinities, than did the *Lepidosiren*, and as he had felt a reluctance to bring before the Society an incomplete description, which might only have served to raise new doubts in the minds of naturalists with regard to this animal, he had deferred since June 1837 the completion and communication of the present paper. He had however at that time prepared a brief description of the specific characters of the specimen in question, under the name of *Protopterus*, and had referred it in the Catalogue of the Museum of the College of Surgeons to the Class of Fishes, on account of its scaly covering and the condition of its nostrils as plicated sacs, and to the abdominal family of the Malacopterygian order of that class, in which it seemed to present an extreme modification or rudimental condition of the fins indicative of a transition from the abdominal to the apodal families.

The anatomical details which formed the principal part of the present communication, confirmed the propriety of referring the *Lepidosiren* to the class of fishes; but they also led, Mr. Owen observed, to a considerable extension in his original views of its affinities in that class.

A minute description was then given of the external characters and peculiarities of the present species, which differed from the *Lepidosiren paradoxa* in the greater relative length of the head and rudimental fins as compared with that of the trunk; and in its general size, which is three-fourths smaller.

The chief peculiarities of the *skeleton* consist in its imperfect, or rather partial ossification, and in the green colour of the ossified parts; in which it resembles that of the gar-pike (*Belone vulgaris*). The parts which continue permanently in the cartilaginous condition are the petrous elements of the temporal bones containing the acoustic labyrinth, a portion of the articular pedicle of the lower jaw, the branchial arches, and the bodies of the vertebræ: these, moreover, are not separated to correspond with the neurapophyses and ribs, as in Plagiostomous Cartilaginous Fishes, but retain their primitive confluent condition as a round continuous chord, extending from the occiput to the end of the tail: this vertebral chord consists of an external firm, elastic, yellowish capsule, enveloping a softer subgelatinous material, as in the Cyclostomous Fishes. The corresponding parts or basilar elements of the cranial vertebræ were ossified: and Mr. Owen then entered upon a detailed description of the skull.

Mr. Owen observed, that since the time of the discovery of the *Ornithorhynchus* there had not been submitted to naturalists a species which proved more strongly the necessity of a knowledge of its whole organization, both external and internal, in order to arrive at a correct view of its real nature and affinities, than did the *Lepidosiren*, and as he had felt a reluctance to bring before the Society an incomplete description, which might only have served to raise new doubts in the minds of naturalists with regard to this animal, he had deferred since June 1837 the completion and communication of the present paper. He had however at that time prepared a brief description of the specific characters of the specimen in question, under the name of *Protopterus*, and had referred it in the Catalogue of the Museum of the College of Surgeons to the Class of Fishes, on account of its scaly covering and the condition of its nostrils as plicated sacs, and to the abdominal family of the Malacopterygian order of that class, in which it seemed to present an extreme modification or rudimental condition of the fins indicative of a transition from the abdominal to the apodal families.

The anatomical details which formed the principal part of the present communication, confirmed the propriety of referring the *Lepidosiren* to the class of fishes; but they also led, Mr. Owen observed, to a considerable extension in his original views of its affinities in that class.

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The ribs are thirty-six pairs, and consist of short, slightly curved, slender styles, encompassing, with the spine, about one-sixth part of the cavity of the abdomen. These ribs are attached to the lower part of the side of the fibrous sheath of the central vertebral chord; their pointed free extremities are cemented to the intermuscular ligaments.

The superior spines are throughout separated from the neurapophyses, and these are not anchylosed together at their upper extremities. Hæmapophyseal spines are developed in the caudal region, and both these and the neurapophyseal spines have articulated to them dermo-osseous spines, of equal length, with their distal extremities expanded, and supporting the transparent elastic horny rays of the caudal fin. The rudimental filiform pectoral and ventral fins were supported each by a single cartilaginous ray composed of many joints.

The muscles of the head, jaws, hyoid and branchial apparatus were then described: the muscular system of the body consists of subvertical layers of oblique fibres separated at brief intervals by aponeurotic intersections.

The following peculiarities of the *Digestive system* were then pointed out;—two long, slightly curved, slender, sharp-pointed teeth project from the intermaxillary bones, which are moveable. The upper maxillary bones support each a single dental plate divided into three cutting lobes, by two oblique notches entering from the outer side: the lower jaw is armed with a single dental plate similarly modified, the produced cutting edges fitting into the notches above: these maxillary teeth somewhat resemble the dental plate of the extinct *Ceratodus* of Agassiz. The fleshy and sensitive parts of the tongue are more developed than in fishes generally. The jaws are adapted to minutely divide and comminute alimentary substances; the pharyngeal opening is contracted; the entrance to the pharynx guarded by a soft semicircular valvular process. Gullet short, straight, narrow, but longitudinally plicated. Stomach simple, straight, with thick walls, in capacity corresponding with the œsophagus; terminating by a valvular pylorus projecting with a scalloped margin into the intestine. No pancreas or spleen. Liver well-developed, partly divided into two lobes. A gall-bladder, and large ductus choledochus, opening by a valvular termination close to the pylorus. Intestine round, straight, at first of equal diameter with the stomach, but gradually contracting to the vent, with thick parietes; traversed internally by a spiral valve describing six gyrations; the first of which is the longest.

The *respiratory organs* consist of branchiæ, and a double elon-

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The *respiratory organs* consist of branchiæ, and a double elon-

gated air-bladder, with the usual vascular and cellular structure of the lungs of a reptile.

The *branchiæ* consist of elongated, sub-compressed, soft, pendulous filaments, attached to cartilaginous branchial arches; these arches are not joined together, or to the os hyoides by an intermediate chain of cartilages or bones below, nor are they articulated to the cranium above. There are six branchial arches on each side, and five intervals for the passage of the water from the mouth to the branchial sac. All the branchial arches do not support branchial filaments; but only the first, fourth, fifth, and sixth. The first and last branchial arches each support a single row, the fourth and fifth each a double row of branchial filaments. The second and third branchial arches have their full proportions, but offer not the slightest trace of gills. The branchial sac is pretty large, and opens externally by a small vertical fissure immediately anterior to the rudimental pectoral extremities.

The *heart* is situate below the œsophagus, in a strong pericardium; it consists of a single auricle and ventricle and a contorted bulbus arteriosus, with a longitudinal valvular process as in the *Siren*. The two branchial arteries, which wind round the gill-less arches, afterwards unite together on each side, and give off branches which form the pulmonary arteries, or those which go to the air-bladders.

The apparatus for aerial respiration commences by a short, single, wide and membranous trachea, or *ductus pneumaticus*, which commences by a longitudinal laryngeal slit, one line in extent, situated three lines behind the orifice of the pharynx: a single plate of cartilage is continued from this laryngeal opening forwards to that of the pharynx: the plate is as broad as the floor of the pharynx, and its office seems to be to prevent the collapse of the parietes of that tube, and to keep a free passage for the air to the trachea. This tube dilates at its lower end into a sac with very thin parietes, which communicates directly with each division or lobe of the air-bladder. These lobes or *lungs* are partially subdivided into small lobes at their anterior and broadest part; and then continue simple and flattened, gradually diminishing to an obtuse point situated behind the posterior extremity of the cloaca. The whole of the parietes of the lungs is honey-combed: the cells are largest, deepest and most vascular and subdivided at the anterior and broader end of the lung. The lungs are situated behind the ovaria, the kidneys, and the peritoneum, which is in contact with merely that part of their ventral flattened surfaces, not covered by other viscera.

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broadest towards the cloaca: the ureters communicate with the back part of the common termination of the oviducts. There were not any suprarenal bodies, nor any spleen.

The *ovaria* are two long, flattened bodies, with ovisacs and ova of different sizes: many between 2 and 3 lines in diameter, scattered among clusters of other ova of smaller size. The *oviducts* are distinct tortuous tubes, which commence by a very wide and thin-coated portion, opening by a slit, 3 lines wide at their anterior extremity, and not communicating with each other before opening into the peritoneal cavity, as in the Plagiostomes. The oviduct contracts and performs many short undulations, adhering to the ovarian capsule as it descends: its coats become thicker, and oblique spiral folds are developed from the inner surface; the capacity of the oviduct increases before its termination, which is by a single prominent opening, common to the two oviducts in the posterior part of the cloaca.

A small *Allantois* is situated between the oviduct and rectum. The cloaca receives the above parts in the following order,—first, or most anteriorly, the common opening of the peritoneal canals; secondly, the anus; thirdly, the Allantoid bladder; fourthly, the oviducts, with the ureters, which open into the back part of the oviducts.

The *brain* consists of two elongated subcompressed distinct cerebral hemispheres; a single elliptical optic lobe, or representative of the bigeminal bodies; a simple transverse cerebellar fold, not covering the widely-open fourth ventricle; largely developed pineal and pituitary glands; and a single corpus mammillare.

The *nerves* given off from the brain, were the olfactory; the optic, which arose from the same point at the middle line between the crura cerebri, and did not decussate; the fifth pair; the acoustic; the pneumogastric; and lingual nerves: there were no traces of the third, fourth, or sixth nerves; there being no muscles to the eyeballs.

The *eyes* are very small, and adhere to the skin, which passes over them without forming any projection: they have a small spherical lens, and no choroid gland.

The *organ of hearing* consists of a vestibule enclosed in a thick cartilaginous case, without external communication except for the foramina transmitting the *portio mollis*: it consists of two large otolithic sacs, containing each a white chalky mass; the external one being six times the size of the one next the brain: above these sacs are three small semicircular canals. No trace of tympanic cavity or *Eustachian tube*.

The *organ of smell* consists of two oval membranous sacs, pli-

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broadest towards the cloaca: the ureters communicate with the back part of the common termination of the oviducts. There were not any suprarenal bodies, nor any spleen.

The *ovaria* are two long, flattened bodies, with ovisacs and ova of different sizes: many between 2 and 3 lines in diameter, scattered among clusters of other ova of smaller size. The *oviducts* are distinct tortuous tubes, which commence by a very wide and thin-coated portion, opening by a slit, 3 lines wide at their anterior extremity, and not communicating with each other before opening into the peritoneal cavity, as in the Plagiostomes. The oviduct contracts and performs many short undulations, adhering to the ovarian capsule as it descends: its coats become thicker, and oblique spiral folds are developed from the inner surface; the capacity of the oviduct increases before its termination, which is by a single prominent opening, common to the two oviducts in the posterior part of the cloaca.

A small *Allantois* is situated between the oviduct and rectum. The cloaca receives the above parts in the following order,—first, or most anteriorly, the common opening of the peritoneal canals; secondly, the anus; thirdly, the Allantoid bladder; fourthly, the oviducts, with the ureters, which open into the back part of the oviducts.

The *brain* consists of two elongated subcompressed distinct cerebral hemispheres; a single elliptical optic lobe, or representative of the bigeminal bodies; a simple transverse cerebellar fold, not covering the widely-open fourth ventricle; largely developed pineal and pituitary glands; and a single corpus mammillare.

The *nerves* given off from the brain, were the olfactory; the optic, which arose from the same point at the middle line between the crura cerebri, and did not decussate; the fifth pair; the acoustic; the pneumogastric; and lingual nerves: there were no traces of the third, fourth, or sixth nerves; there being no muscles to the eyeballs.

The *eyes* are very small, and adhere to the skin, which passes over them without forming any projection: they have a small spherical lens, and no choroid gland.

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cated internally, and having each a single external aperture upon the upper lip; but without any communication with the mouth,—a structure which the author observed was perhaps the only single character which unexceptionably proved the *Lepidosiren* to be a true fish. The remaining evidence of its ichthyic nature reposed rather upon the concurrence of many less decisive characters.

These characters were stated to be, its covering of large round scales; the mucous ducts of the head and lateral line; the many-jointed soft ray supporting the rudimental pectoral and ventral fins; the gelatinous vertebral chord, united anteriorly to the whole of the basi-occipital, and not to two condyles as in Batrachia; a præ-opercular bone, the intermaxillary bone being moveable; the lower jaw having each ramus composed simply of a post-mandibular and dentary piece; the double row of spinous processes, both above and below the vertebral chord; the green colour of the ossified parts of the skeleton; the straight intestine, with its spiral valve; the absence of pancreas and spleen; the single peritoneal outlet; the position of the anus; the single auricle of the heart; the number of branchial arches, and the internal position of the gills; a long lateral nerve; acoustic labyrinth with large otolithes. These characters, with the nasal sacs opening only externally, prove satisfactorily the *Lepidosiren* to be a true Fish, and not a Perennibranchiate Reptile.

In the class of fishes, Mr. Owen pointed out the interesting relations of the *Lepidosiren* as a link connecting the Cartilaginous fishes with the Malacopterygians, and especially with the *Sauroid* genera, *Polypterus* and *Lepidosteus*, and at the same time making the nearest approach in the class of fishes to the Perennibranchiate Reptiles.

For the species here described Mr. Owen proposed the name of *Lepidosiren annectens*. It is a native of the river Gambia, Africa.

ROYAL IRISH ACADEMY.

January 28.—Sir Wm. R. Hamilton, A.M., President, in the Chair.

Mr. Ball read a Paper on the Remains of Oxen found in the Bogs of Ireland.

Having alluded to the occurrence of fossil remains of oxen in Britain, and the existence of the Auroch or Wild Ox, in some parks in that country, he remarked on the old and generally received opinion, that Ireland could not furnish any evidence of having ever possessed an indigenous ox; and he stated, that a specimen which he received from the sub-marine forest, in the Bay of Youghal, seemed to have been the core of a horn of the fossil ox, often found in Bri-

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Mr. Ball exhibited specimens and drawings, and solicited the co-operation of Members of the Academy in effecting a perfect elucidation of the subject, by collecting specimens from the bogs of the country.

April 8.—Dr. Wilde, a visiter, by permission of the Academy, read a paper on some Discoveries he had made at Tyre, relating to the manufacture of the celebrated Purple Dye.

Dr. Wilde stated, that having been engaged in investigating the ruins of Tyre, he discovered several circular apertures or reservoirs cut in the solid sandstone rock close to the water's edge along the southern shores of the Peninsula. These in shape resembled a large pot, and varied in size from two to eight feet in diameter, and from four to five deep ; some were in clusters, others isolated, and several were connected in pairs by a conduit about a foot deep. Many of those reservoirs were filled with a breccia solely composed of broken up shells, bound together by carbonate of lime, and a small trace of strontian ; large heaps of a similar breccia were found in the vicinity of the pots. This mass, a portion of which Dr. Wilde exhibited to the Academy, is exceedingly heavy, of adamantine hardness, and the shells of which it is composed appear to be all of *one* species, and from the sharpness of their fracture, were evidently broken by art and not worn or water-washed. The portions of shell were examined by eminent naturalists, and are pronounced to be the *Murex trunculus*, which most conchologists agree was one species from which the Tyrian dye was obtained, but until now, no *proof* could be given of its being the actual shell.

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## BOTANICAL SOCIETY OF LONDON.

October 5th.—J. E. Gray, Esq., F.R.S., President, in the Chair.

Mr. Daniel Cooper, the Curator, exhibited a specimen of the natural living fence mentioned at a former meeting, vol. ii. p. 234. Mr. James Rich communicated a translation from the French "On the Formation of Crystals in the Cellules of Plants."

November 2nd.—The President in the Chair.

Dr. F. Bossey read a paper, being the results of an excursion from Woolwich to Cobham, Kent, made in company with several members of the Society. At the commencement of the paper Dr. B. alluded to the general imperfect manner in which the habitats of uncommon species were in general described, and proposed the use of the compass in defining particular habitats. Particular attention was directed to the habitat of *Polypogon monspeliensis* and *P. littoralis*, which were discovered in the marshes east of Woolwich, particularly in front of the south of the *butt* or mound in the Plumstead practice ground.

On ditch banks, forming the east border of the practice ground, *Poa distans*, *P. procumbens*, and *P. maritima*, were observed, and in the water *Zannichellia palustris*, *Potamogeton pectinatum* and *Scirpus lacustris* with the *Polygonum maritimum* of Ray, see vol. ii. p. 234. In the hedge banks towards Plumstead a small patch of *Erysimum cheiranthoides* was noticed. Passing over Plumstead Common to a road called the King's Highway, Dr. B. found in a little wood on the right the *Orobus tenuifolius* of Roth. This plant, which Willdenow, Smith, and Hooker agree in regarding as a narrow-leaved variety of *O. tuberosus*, is considered by Don and others as a distinct species. The characters which are permanent in cultivated plants are given by Mr. D. Don in the 3rd volume of the Memoirs of the Wernerian Society, and sufficiently distinguish it from the common species. In fields, near Darne Wood, the following plants were met with—*Linaria minor*, *Elatine* and *spuria*, *Adonis autumnalis*, *Ajuga Chamæpitys*, *Anagallis cærulea*, *Galium tricorne*, *Papaver hybridum* and som-

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On ditch banks, forming the east border of the practice ground, *Poa distans*, *P. procumbens*, and *P. maritima*, were observed, and in the water *Zannichellia palustris*, *Potamogeton pectinatum* and *Scirpus lacustris* with the *Polygonum maritimum* of Ray, see vol. ii. p. 234. In the hedge banks towards Plumstead a small patch of *Erysimum cheiranthoides* was noticed. Passing over Plumstead Common to a road called the King's Highway, Dr. B. found in a little wood on the right the *Orobus tenuifolius* of Roth. This plant, which Willdenow, Smith, and Hooker agree in regarding as a narrow-leaved variety of *O. tuberosus*, is considered by Don and others as a distinct species. The characters which are permanent in cultivated plants are given by Mr. D. Don in the 3rd volume of the Memoirs of the Wernerian Society, and sufficiently distinguish it from the common species. In fields, near Darne Wood, the following plants were met with—*Linaria minor*, *Elatine* and *spuria*, *Adonis autumnalis*, *Ajuga Chamæpitys*, *Anagallis cærulea*, *Galium tricorne*, *Papaver hybridum* and som-

Dr. Wilde is of opinion that the reservoirs he discovered were the vats or mortars in which the shells were broken up, in order to obtain the dye (which lies in a sac in the neck of the mollusc inhabiting them,) and showed that it accurately accords with the description of Pliny, who states, that the smaller shells (of which those in the specimen are examples) were broken in *certain mills*.

## BOTANICAL SOCIETY OF LONDON.

October 5th.—J. E. Gray, Esq., F.R.S., President, in the Chair.

Mr. Daniel Cooper, the Curator, exhibited a specimen of the natural living fence mentioned at a former meeting, vol. ii. p. 234. Mr. James Rich communicated a translation from the French "On the Formation of Crystals in the Cellules of Plants."

November 2nd.—The President in the Chair.

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November 16th.—The President in the Chair.

Specimens of the fruit, bark, and liber of *Bertholletia excelsa* were announced, presented by R. H. Schomburgk, Esq. now in British Guiana. Mr. Chatterley read a paper on the importance of "Botanical Statistics," illustrated by the order *Coniferae*, which led to much interesting discussion.

November 29th.—The President in the Chair.

This being the second Anniversary of the Society, the Secretary read the report of the Council, from which it appeared that the present number of Members is 100, of which 42 are Resident, 34 Corresponding, and 24 Foreign, 47 having been elected since the last Anniversary. In the Treasurer's report it was stated that the receipts amounted to 71*l.* 16*s.* 6*d.*, and the expenditure to 66*l.* 16*s.* 10*d.*, leaving a balance in the hands of the Treasurer of 4*l.* 19*s.* 8*d.* exclusive of subscriptions for the ensuing year. The President congratulated the Society on its present condition as contrasted with the report of the state of the funds at the last Anniversary, when the Society were 35*l.* 17*s.* 6*d.* in arrears. Donations to the library were announced from 13 Members, and to the herbarium from 42. The number of British plants received amount to 18,592 specimens, including a valuable collection of British *Salices* from Mr. W. Baxter, A.L.S., of the Botanic Garden, Oxford. The number of foreign specimens received amount to upwards of 10,000, including 4000 species, principally received from H. B. Fielding, Esq., F.L.S., Baron Macedo, A. White, and the Botanical Society of Edinburgh. The report also announced that the Council had opened a correspondence with the Botanical Society of Edinburgh, and that an exchange of specimens will annually take place between both Societies. The Council have also caused to be published a list of the Natural Orders and Genera of DeCandolle, together with the Linnæan Classes and Orders, in such a form as to allow of cutting out to paste on the labels of collections: this, together with the Edinburgh Societies' list of species, will form a complete *printed* index to British Herbaria. The report was unanimously adopted. Ballot then took place for the officers of the ensuing year: J. G. Gray, Esq., F.R.S., was re-elected President, who appointed J. E. Children, V.P.R.S., &c., and Dr. D. C. Macreight, F.L.S., Vice-Presidents; John Reynolds, Esq. was re-elected Treasurer, together with Daniel Cooper, Esq., A.L.S., Curator, and George

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DUBLIN NATURAL HISTORY SOCIETY.

We have received the first annual report of the above-named Association, established in March 1838, "for promoting the Investigation of the Natural History of Ireland," and were gratified to see the attempt made to institute a society of this character in the metropolis of Ireland. It already consists of one hundred and thirty-six members, and a museum and library have been founded. The rules are very ample, consisting of thirty-eight articles, which a little further experience in their wording may perhaps condense, while the chief aim of the society is stated to be "undivided attention to the study of the natural history of Ireland by forming a standard collection of species;" and the reading of papers at the evening meetings, "when a free and unrestrained communication of facts would be encouraged." The report above alluded to is unassumingly drawn up, and relates rather to statistics than to the transactions of the meetings. It is to be continued annually, we trust in the form of an address to the members; and we would recommend a little detail being entered into of the proceedings of the bygone year, both as a useful summary to the members themselves, and as valuable to persons at a distance interested in the zoology of the British Islands, and who could scarcely otherwise become acquainted with what discoveries had been made or what additional information had been obtained.

NATURAL HISTORY SOCIETY FOR THE WEST RIDING OF YORKSHIRE.

Henry Denny, Esq. of Leeds, the author of a History of the British *Pselaphidæ*\*, is at present attempting to establish a Society in the West Riding of Yorkshire, for the promotion of the local Natural History, and we trust he may be successful. This is one of the objects which has been recommended by the British Association, as tending in an eminent manner to render our knowledge of the zoology and botany of the country complete, and the additions which have been made of late years both of new species and of valuable information regarding some previously accounted rare or little known by the researches of local investigators, is ample testimony that the

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## ZOOLOGICAL SOCIETY.

August 14, 1838.—William Yarrell, Esq., in the Chair.

A series of skins, belonging to species of the genus *Sciurus*, including, with one or two exceptions, all which are known to inhabit North America, were upon the table; and the Rev. Dr. Bachman, of S. Carolina, brought them severally before the notice of the Members. Six of the species exhibited were new, and for these he proposed the specific names of *Texianus*, *lanuginosus*, *fuliginosus*, *subauratus*, *Auduboni*, and *Richardsoni*. Dr. Bachman's manuscript notes upon the habits and characters of the North American Squirrels, with descriptions of the newly characterized species, were also laid before the Meeting.

The first species noticed by Dr. Bachman is the *Sciurus capistratus* of Bosc, or Fox Squirrel; *vulpinus* of Gmel.; *niger*, Catesby; *variegatus*, Desm.; the Black Squirrel of Bartram. Its essential characters consist in its large size, in having the tail longer than the body, the hair coarse, and the ears and nose white. The dental formula is  $inc. \frac{2}{2}$ ,  $can. \frac{0-0}{0-0}$ ,  $mol. \frac{4-4}{4-4}$ .

*Sciurus Texianus*. Texian Squirrel. This name is proposed by Dr. Bachman for an apparently undescribed species which he saw in the Museum at Paris. It was said to have been received from Mexico. In the Museums of Berlin and Zurich, he also found what he conceives to be the same species; and in the British Museum

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recommendation should be attended to. The plan proposed is nearly that acted upon by the Berwickshire Naturalists' Club, which has now continued for several years, holding five meetings annually, examining the adjacent country during the days of assembling, and bringing together after a frugal but always well-relished dinner the results of the different excursions. There is no subscription, and a few shillings from each member suffices to defray the expense of printing the Transactions and annual address, which already hold an important place in the literature of our natural history. Mr. Denny remarks, "I feel confident, that if such an association were formed for the West Riding, (than which no district of equal extent in the kingdom is richer for varieties of soil, suitable localities, diversity and abundance of its productions,) a large mass of highly valuable materials might be collected, our knowledge of the organised beings surrounding us increased, and much friendly and scientific intercourse carried on, to the mutual benefit of all parties." It will give us satisfaction to learn that Mr. Denny's project has been realised.

## ZOOLOGICAL SOCIETY.

August 14, 1838.—William Yarrell, Esq., in the Chair.

A series of skins, belonging to species of the genus *Sciurus*, including, with one or two exceptions, all which are known to inhabit North America, were upon the table; and the Rev. Dr. Bachman, of S. Carolina, brought them severally before the notice of the Members. Six of the species exhibited were new, and for these he proposed the specific names of *Texianus*, *lanuginosus*, *fuliginosus*, *subauratus*, *Auduboni*, and *Richardsoni*. Dr. Bachman's manuscript notes upon the habits and characters of the North American Squirrels, with descriptions of the newly characterized species, were also laid before the Meeting.

The first species noticed by Dr. Bachman is the *Sciurus capistratus* of Bosc, or Fox Squirrel; *vulpinus* of Gmel.; *niger*, Catesby; *variegatus*, Desm.; the Black Squirrel of Bartram. Its essential characters consist in its large size, in having the tail longer than the body, the hair coarse, and the ears and nose white. The dental formula is *inc.*  $\frac{2}{2}$ , *can.*  $\frac{0-0}{0-0}$ , *mol.*  $\frac{4-4}{4-4}$ .

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there is a specimen obtained at Texas by Mr. Douglas, agreeing with the others in almost every particular. Dr. Bachman also states that, among his notes there is a description of a specimen received by a friend from the south-western parts of Louisiana, which, on a comparison with memoranda taken from the other specimens, does not appear to differ in any important particular. Hence, he thinks it probable that this species has a tolerably extensive range extending perhaps from the south-western portions of Louisiana, through Texas, into Mexico.

The Texian Squirrel is about the size of the Fox Squirrel. On the upper surface there is a mixture of black and yellow, and on the under parts deep yellow. The under sides of the limbs, and also the parts of the body contiguous, are whitish. Fore-legs externally, and the feet, rich yellow: ears, on both surfaces, yellow, with interspersed white hairs: nose and lips, brownish white: hairs of tail, rich rusty yellow at base, with a broad black space near the extremity, and finally tipped with yellow.

Dimensions.	in.	lines.
Length of body . . . . .	13	6
Tail to end of hair . . . . .	15	0
Tarsus . . . . .	3	0
Height of ears to end of fur . . . . .	0	6½

The Texian Squirrel bears some resemblance to the *Sciurus capistratus*. The latter species, however, in all the varieties hitherto examined by Dr. Bachman, has uniformly the white ears and nose.

This species would appear to replace the *Capistratus* in the south-western parts of America.

*SCIURUS SUBAURATUS.* *Sci. corpore suprâ cinereo, flavo lavato, infrâ austerè aureo, caudâ corpore longiore. Dentes, inc.  $\frac{2}{2}$ , mol.  $\frac{4-4}{4-4}$ .*

The designation "Golden-bellied Squirrel," and the specific term *subauratus*, are given by Dr. Bachman to a species, of which two dead specimens were procured in the markets of New Orleans by Mr. Audubon. Their size was between that of the Northern Gray, and the Little Carolina Squirrel. There was no trace of the small anterior upper molar generally found in the species of the genus *Sciurus*. The upper incisors are of a deep orange brown colour, and of moderate size: under incisors a little paler than the upper; the head is of moderate size; whiskers longer than the head; the ears are short and pointed, and clothed with hair on both surfaces. The body seems better formed for agility than that of the small Carolina, in this respect approaching nearer to the Northern Gray Squirrel.

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The colour of the whole upper surface is gray, with a distinct yellow tint. The hairs, which give this outward appearance, are grayish slate colour at their base, then very broadly annulated with yellow; then black, and near the apex annulated with yellowish white. The sides of the face and neck, the whole of the inner side of the limbs, feet, and the whole of the under parts, of a deep golden yellow; on the cheeks and sides of the neck, however, the hairs are obscurely annulated with black and whitish; the ears are well clothed on both surfaces with tolerably long hairs of the same deep golden hue as the sides of the face; hairs of the feet are mostly blackish at the root, and some are obscurely tipped with black; hairs of the tail black at the roots, and the remaining portion of a bright rusty yellow; each hair three times in its length annulated with black; the under surface of the tail is chiefly bright rusty yellow; whiskers longer than the head, black.

*Sciurus magnicaudatus*, Harlan's Fauna, p. 170. *S. macrourus*, Say. Long's Expedition, vol. i. p. 115.

Of this species Dr. Bachman remarks, that although he has seen many specimens labelled under the above name, yet the only true *S. macrourus* which has come under his own observation, is one in the Philadelphia Museum.

*Sciurus aureogaster*, F. Cuv. et Geoff. Mamm. Californian Squirrel.  
*Habitat* Mexico and California.

*Sciurus cinereus*. Gmel. Cat Squirrel, Pen. Arct. Zool. i. 137.

A little smaller than the Fox Squirrel; larger than the Northern Gray Squirrel; body stout; legs rather short; nose and ears not white; tail longer than the body. Dental formula, *incis.*  $\frac{2}{2}$ , *can.*  $\frac{0-0}{0-0}$ , *mol.*  $\frac{4-4}{4-4}$ , = 20.

"This squirrel has many habits in common with other species, residing in the hollows of trees, building in summer its nest of leaves in some convenient crutch, and subsisting on the same variety of food. It is, however, the most inactive of all our known species. It mounts a tree, not with the lightness and agility of the Northern Gray Squirrel, but with the slowness and apparent reluctance of the little Striped Squirrel (*Tamias Lysteri*). After ascending, it does not mount to the top, as is the case with other species, but clings to the body of the tree on the side opposite to you, or tries to conceal itself behind the first convenient limb. I have never observed it escaping from branch to branch. When it is induced in

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“The Cat Squirrel does not appear to be migratory in its habits. The same pair, if undisturbed, may be found taking up their residence in a particular vicinity for a number of years in succession, and the sexes seem mated for life.”

*Sciurus leucotis*. Northern Gray Squirrel.

Gray Squirrel. Penn. Arct. Zool. vol. i. p. 135. Hist. Quad. No. 272.

*Sci. Carolinensis*. Godman non Gmel.

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Larger than the Carolina Gray Squirrel; tail much longer than the body; smaller than the Cat Squirrel; subject to many varieties of colour.

Dental formula, *incis.*  $\frac{2}{2}$ , *mol.*  $\frac{5-5}{4-4}$ , = 22.

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This species is smaller than the Northern Gray Squirrel, and has the tail, which is the same length as its body, narrower than in that species. The colour above is rusty gray, beneath white, and not subject to variation.

*Sciurus Colliæi*. For a description of this species, of which the original specimen is in the Collection of the Zoological Society, Dr. Bachman refers to Dr. Richardson's Appendix to Capt. Beechey's Voyage.

*Sciurus nigrescens*. A species described by Mr. Bennett, in the Proceedings of the Zool. Soc. for 1833, p. 41.

*Sciurus niger*, Linn. non Catesby. The Black Squirrel.

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SCIURUS AUDUBONI. Larger Louisiana Black Squirrel.

*Sciurus corpore suprâ nigro, subtùs fuscescente; caudâ corpus longitudine æquante.*

A new species, for which Dr. Bachman is indebted to Mr. Audubon. It has the fur very harsh to the touch, and is rather less in size than the *Sciurus niger*.

SCIURUS FULIGINOSUS. Sooty Squirrel.

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*Sciurus corpore suprâ nigro et fuscescenti-flavo irrorato, subtùs*

search of food to proceed to the extremity of a limb, it moves cautiously and heavily, and returns the same way. On the ground it runs clumsily and makes slower progress than the Gray Squirrel. It is usually fat, especially in autumn, and the flesh is said to be preferable to that of any other of our species.

“The Cat Squirrel does not appear to be migratory in its habits. The same pair, if undisturbed, may be found taking up their residence in a particular vicinity for a number of years in succession, and the sexes seem mated for life.”

*Sciurus leucotis*. Northern Gray Squirrel.

Gray Squirrel. Penn. Arct. Zool. vol. i. p. 135. Hist. Quad. No. 272.

*Sci. Carolinensis*. Godman non Gmel.

*Sci. leucotis*. Gapper, Zoological Journal, vol. v. p. 206, published in 1830.

Larger than the Carolina Gray Squirrel; tail much longer than the body; smaller than the Cat Squirrel; subject to many varieties of colour.

Dental formula, *incis.*  $\frac{2}{2}$ , *mol.*  $\frac{5-5}{4-4}$ , = 22.

*Sciurus Carolinensis*, Gmel. Little Carolina Gray Squirrel.

This species is smaller than the Northern Gray Squirrel, and has the tail, which is the same length as its body, narrower than in that species. The colour above is rusty gray, beneath white, and not subject to variation.

*Sciurus Colliæi*. For a description of this species, of which the original specimen is in the Collection of the Zoological Society, Dr. Bachman refers to Dr. Richardson's Appendix to Capt. Beechey's Voyage.

*Sciurus nigrescens*. A species described by Mr. Bennett, in the Proceedings of the Zool. Soc. for 1833, p. 41.

*Sciurus niger*, Linn. non Catesby. The Black Squirrel.

A little larger than the Northern Gray Squirrel; fur soft and glossy. Ears, nose, and the whole body, pure black; a few white tufts of hair interspersed. *Incis.*  $\frac{2}{2}$ , *canines*  $\frac{0-0}{0-0}$ , *molars*  $\frac{4-4}{4-4}$ , = 20.

SCIURUS AUDUBONI. Larger Louisiana Black Squirrel.

*Sciurus corpore suprâ nigro, subtùs fuscescente; caudâ corpus longitudine æquante.*

A new species, for which Dr. Bachman is indebted to Mr. Audubon. It has the fur very harsh to the touch, and is rather less in size than the *Sciurus niger*.

SCIURUS FULIGINOSUS. Sooty Squirrel.

*Sciurus corpore suprâ nigro et fuscescenti-flavo irrorato, subtùs*



*fuscescente* ; *cauda corpore valdè longiore* : *dentes inc.*  $\frac{2}{2}$ ,  
*mol.*  $\frac{5-5}{4-4}$ .

Dr. Bachman remarks of this species, "I am indebted to J. W. Audubon, Esq., for a specimen of an interesting little Squirrel obtained at New Orleans on the 24th March, 1837, which I find agreeing in most particulars with the specimen in the Philadelphia Museum, referred by American authors to *Sciurus rufiventer*."

"Dr. Harlan's description does not apply very closely to the specimen in question, but seems to be with slight variations that of Desmarest's description of *Sciurus rufiventer*."

"The following description is taken from the specimen procured by Mr. Audubon. It was that of an old female, containing several young, and I am enabled to state with certainty that it was an adult animal."

"I have given to this species the character of 22 teeth, from the circumstance of my having found that number in the specimen from which I described. The animal could not have been less than a year old. The anterior molars in the upper jaw are small; the inner surface of the upper grinders is obtuse, and the two outer points on each tooth are elevated and sharper than those of most other species. In the lower jaw the molars regularly increase in size from the first, which is the smallest, to the fourth, which is the largest. Head short and broad; nose very obtuse; ears short and rounded, slightly clothed with hair; feet and claws rather short and strong; tail short and flattened, but not broad, resembling that of the *Sc. Hudsonius*. The form of the body, like that of the little Carolina Squirrel, is more indicative of strength than of agility."

"The hairs on the upper part of the body, the limbs externally and feet, are black, obscurely grizzled with brownish yellow. On the under parts, with the exception of the chin and throat, which are grayish, the hairs are annulated with brownish orange and black, and a grayish white at the roots. The prevailing colour of the tail above is black, the hairs however are brown at base and some of them are obscurely annulated with brown, and at the apex pale brown. On the under side of the tail the hairs exhibit pale yellowish brown annulations."

*Sciurus Douglasii*, Gray. *Oppoce-poce*, Indian name.

A species about one-fourth larger than the Hudson's Bay Squirrel; tail shorter than the body. Colour: dark brown above, and bright buff beneath. Dental formula; *incis.*  $\frac{2}{2}$ , *can.*  $\frac{0-0}{0-0}$ , *mol.*  $\frac{4-4}{4-4}$ , = 20.

*Sciurus Hudsonius*, (Pennant). The Chickaree Hudson's Bay Squirrel. Red Squirrel.

*fuscescente* ; *cauda corpore valdè longiore* : *dentes inc.*  $\frac{2}{2}$ ,  
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"The hairs on the upper part of the body, the limbs externally and feet, are black, obscurely grizzled with brownish yellow. On the under parts, with the exception of the chin and throat, which are grayish, the hairs are annulated with brownish orange and black, and a grayish white at the roots. The prevailing colour of the tail above is black, the hairs however are brown at base and some of them are obscurely annulated with brown, and at the apex pale brown. On the under side of the tail the hairs exhibit pale yellowish brown annulations."

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"The hairs on the upper part of the body, the limbs externally and feet, are black, obscurely grizzled with brownish yellow. On the under parts, with the exception of the chin and throat, which are grayish, the hairs are annulated with brownish orange and black, and a grayish white at the roots. The prevailing colour of the tail above is black, the hairs however are brown at base and some of them are obscurely annulated with brown, and at the apex pale brown. On the under side of the tail the hairs exhibit pale yellowish brown annulations."

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"The hairs on the upper part of the body, the limbs externally and feet, are black, obscurely grizzled with brownish yellow. On the under parts, with the exception of the chin and throat, which are grayish, the hairs are annulated with brownish orange and black, and a grayish white at the roots. The prevailing colour of the tail above is black, the hairs however are brown at base and some of them are obscurely annulated with brown, and at the apex pale brown. On the under side of the tail the hairs exhibit pale yellowish brown annulations."

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*Sciurus Hudsonius*, (Pennant). The Chickaree Hudson's Bay Squirrel. Red Squirrel.

The Hudson's Bay Squirrel, a well-known species, is a third smaller than the Northern Gray Squirrel; tail shorter than the body; ears slightly tufted. Colour, reddish above, white beneath. Dental formula: *incis.*  $\frac{2}{2}$ , *can.*  $\frac{0-0}{0-0}$ , *mol.*  $\frac{4-4}{4-4}$ , = 20.

*Sciurus Richardsoni.* Columbia Pine Squirrel.

Small Brown Squirrel. Lewis and Clarke, vol. iii. p. 37.

*Sciurus Hudsonius*, var.  $\beta$ . Columbia Pine Squirrel. Richardson, Fauna Boreali-Americana, p. 190.

Smaller than *Sc. Hudsonius*; tail shorter than the body; rusty gray above, whitish beneath; extremity of the tail black.

This small species was first noticed by Lewis and Clarke, who deposited a specimen in the Philadelphia Museum, where it still exists. I have compared it with the specimen brought by Dr. Townsend, and find them identical. Dr. Richardson, who appears not to have seen it, supposes it to be a mere variety of the *Sciurus Hudsonius*.

Dental formula: *incis.*  $\frac{2}{2}$ , *can.*  $\frac{0-0}{0-0}$ , *mol.*  $\frac{4-4}{4-4}$ , = 20.

"The body of this most diminutive of all the known species of genuine squirrel in North America, is short, and does not present that appearance of lightness and agility which distinguishes the *Sciurus Hudsonius*. Head large, less elongated, forehead more arched, and nose a little blunter than *Sc. Hudsonius*; ears short; feet of moderate size. The third toe on the fore-feet but slightly longer than the second; the claws are compressed, hooked and acute; tail shorter than the body; the thumb-nail is broad, flat and blunt.

"The fur on the back is dark plumbeous from the roots, tipped with rusty brown and black, giving it a rusty gray appearance. It is less rufous than the *Sc. Hudsonius*, and lighter coloured than the *Sc. Douglasii*. The feet on their upper surface are rufous: on the shoulders, forehead, ears, and along the thighs, there is a slight tinge of the same colour. The whiskers, which are a little longer than the head, are black. The whole of the under surface, as well as a line around the eyes, and a small patch above the nostrils, smoke-gray. The tail for about one half its length presents on the upper surface a dark rufous appearance, many of the hairs being nearly black, pointed with light rufous: at the extremity of the tail, for about an inch and three-fourths in length, the hairs are black, a few of them slightly tipped with rufous. The hind-feet, from the heel to the palms, are thickly clothed with short adpressed light-coloured hairs; the palms are naked. The sides of the body are marked by a line of black commencing at the shoulder and ter-

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minating abruptly on the flanks: this line is about two inches in length and four lines wide.

*SCIURUS LANUGINOSUS.* Downy Squirrel.

*Sciurus corpore suprâ flavescenti-griseo, lateribus argenteo-cinereis, abdomine albo: pilis mollibus et lanuginosis: auribus brevibus: palmis pilis sericeis crebrè instructis; caudâ corpore breviorè.*

“A singular and beautiful quadruped, to which I have conceived the above name appropriate, was sent to me with the collection of Dr. Townsend. He states in his letter, ‘Of this animal I have no further knowledge than that it was killed on the North-west coast, near Sitka, where it is said to be common: it was given to me by my friend W. F. Tolmie, Esq., surgeon of the Hon. Hudson’s Bay Company. I saw three other specimens from Paget’s Sound, in the possession of Capt. Brotchie, and understood him to say that it was a burrowing animal.’ Sitka is, I believe, the principal settlement of the Russians on Norfolk Sound and Paget’s Sound, a few degrees North of the Columbia River.

“The head is broader than that of the *Sc. Hudsonius*, and the forehead much arched. The ears, which are situated far back on the head, are short, oval, and thickly clothed with fur; they are not tufted as in the *Sc. Hudsonius* and *Sc. vulgaris* of Europe, but a quantity of longer fur, situated on the outer base of the ear, and rising two or three lines above the margins, give the ears the appearance of being somewhat tufted. In the Squirrels generally, the posterior margin of the ear doubles forward to form a valve over the auditory opening, and the anterior one curves to form a helix; in the present species the margins are less folded than those of any other species I have examined. The whiskers are longer than the head; feet and toes short; rudimental thumb armed with a broad flat nail; nails slender, compressed, arched and acute; the third on the fore-feet is a little the longest, as in the Squirrels. The tail bears some resemblance to that of the Flying Squirrel, and is thickly clothed with hair, which is a little coarser than those on the back. On the fore-feet the palms are only partially covered with hair; but on the hind feet, the under surface, from the heel even to the extremity of the nails, is thickly clothed with short soft hairs.

“The fur is softer and more downy than that of any other North American species, and the whole covering of the animal indicates it to be a native of a cold region.

“Dental formula: *incis.*  $\frac{2}{2}$ , *can.*  $\frac{0-0}{0-0}$ , *mol.*  $\frac{4-4}{4-4}$ , = 20.

“The upper incisors are smaller and more compressed than those of *Sc. Hudsonius*; the lower ones are a little longer and sharper than  
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“The head is broader than that of the *Sc. Hudsonius*, and the forehead much arched. The ears, which are situated far back on the head, are short, oval, and thickly clothed with fur; they are not tufted as in the *Sc. Hudsonius* and *Sc. vulgaris* of Europe, but a quantity of longer fur, situated on the outer base of the ear, and rising two or three lines above the margins, give the ears the appearance of being somewhat tufted. In the Squirrels generally, the posterior margin of the ear doubles forward to form a valve over the auditory opening, and the anterior one curves to form a helix; in the present species the margins are less folded than those of any other species I have examined. The whiskers are longer than the head; feet and toes short; rudimental thumb armed with a broad flat nail; nails slender, compressed, arched and acute; the third on the fore-feet is a little the longest, as in the Squirrels. The tail bears some resemblance to that of the Flying Squirrel, and is thickly clothed with hair, which is a little coarser than those on the back. On the fore-feet the palms are only partially covered with hair; but on the hind feet, the under surface, from the heel even to the extremity of the nails, is thickly clothed with short soft hairs.

“The fur is softer and more downy than that of any other North American species, and the whole covering of the animal indicates it to be a native of a cold region.

“Dental formula:  $\text{incis. } \frac{2}{2}, \text{ can. } \frac{0-0}{0-0}, \text{ mol. } \frac{4-4}{4-4} = 20.$

“The upper incisors are smaller and more compressed than those of *Sc. Hudsonius*; the lower ones are a little longer and sharper than  
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minating abruptly on the flanks: this line is about two inches in length and four lines wide.

*SCIURUS LANUGINOSUS.* Downy Squirrel.

*Sciurus corpore suprà flavescenti-griseo, lateribus argenteo-cinereis, abdomine albo: pilis mollibus et lanuginosis: auribus brevibus: palmis pilis sericeis crebrè instructis; caudà corpore breviorè.*

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the upper : the upper grinders, on their inner surface, have each an elevated ridge of enamel ; on the outer crest or edge of the tooth, there are three sharp points instead of two obtuse elevations, as in the Squirrels generally, and in this particular it approaches the *Spermophiles*. In the lower jaw, the grinders, which are quadrangular in shape, present each four sharp points.

“On the back and tail there are so many white hairs interspersed, the white spot on the head being merely occasioned by a greater number of hairs nearly or wholly white, that there is great reason to believe that this species becomes much lighter, if not wholly white, during winter.

“In the shape of the head and ears, and in the pointed projections of the teeth, this species approaches the Marmots and *Spermophiles* ; but in the shape of its body, its soft fur, its curved and acute nails, constructed more for climbing than digging in the earth, and in the third toe being longer than the second, it must be placed among the Squirrels.”

Mr. Ogilby pointed out the characters of a new species of Muntjac Deer, which lately died at the Gardens. This species is about the same size as the common Indian Muntjac, but has a longer head and tail ; has less red, and more blue in the general shade of the colouring, and is readily distinguished by the want of the white over the hoofs, which is so apparent in its congener. The specimen, a male, was brought from China by J. R. Reeves, Esq., to whom the Society is already indebted for many rare and valuable animals, and to whom Mr. Ogilby proposed to dedicate the present species by applying the name of *Cervus Reevesi*. A female specimen which accompanied that here described, is still living and has lately produced a fawn, which is interesting from exhibiting the spotted character common to the generality of the young in this extensive group.

## MISCELLANEOUS.

### FORMATION OF INDIGO IN *POLYGONUM TINCTORIUM*.

Prof. Morren of Liège in a memoir read before the Academy of Sciences at Brussels, on the culture of, and method of obtaining the indigo from *Polygonum tinctorium*, makes the following statement with respect to the formation of the indigo in the leaves of this plant :— “The indigo,” he observes, “is contained in the mesophylle of the leaf especially. It is dissolved originally in a liquid which fills the cells, and in which float pure granules of chlorophylle either inclo-

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